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Mr. Chairman and Members, I am here today to contribute what I believe will be some tangible answers and solutions to the many problems and challenges facing the Commission and the State of California in terms of energy policy. It is my hope that what you will learn from this presentation will be officially incorporated into the State's comprehensive energy planning processes.

First, I want to commend the Commission and its staff for the excellent work that has gone into the preparation of the Draft Report. I also want to commend Governor Schwarzenegger for his leadership role in setting the tone for the type of energy policy that will be needed to help ensure that California citizens will have sufficient, cost-effective, and environmentally-responsible sources of power for the future.

I want to share two specific program concepts with the Commission. The first has to do with energy efficiency and conservation. The second has to do with power generation. My partners and I stand ready to work with the Commission and the State of California to implement the opportunities you will hear about today.

Energy Efficiency

In terms of energy efficiency, one of the greatest challenges over the years has been our previous inability to deal with one of the biggest culprits in wasting electrical energy: the electric motor. Over 60 percent of the nation's electricity is consumed by electric motors. Electric motors, by their very design and function, are extremely wasteful of electrical energy. What has been needed is a means of altering the manner in which electric motors manage and consume power while they are functioning. I am happy to report to you today that the technology to revolutionize the functions of electric motors is at hand and will soon be available nationwide. The new technology to which I am referring is called a Signal Analyzing Motor Manager (SAMM).

In order to gain perspective, let us consider the following ways that electric motors waste electricity:

- In the startup phase, it takes a huge surge of power to get a motor started
- As they are running, most motors are drawing a constant amount of power regardless of whether or not that much power is actually needed to handle the load requirements at any given moment

The SAMM device addresses these two inefficiencies of the electric motor by doing the following:

- Through SAMM's unique proprietary technology, it "reads" the "signals" emitted by every electric motor
- Provides what is called a "soft start" of the electric motor that drastically reduces the spike in electrical consumption at startup
- Provides the motor with only the amount of electricity needed at any given moment to carry the work load at hand instead of continuously consuming unneeded power
- Through its technology, actually breaks the current flow to the motor several times per second thereby creating further efficiency and cost savings

In addition to these efficiency factors, the SAMM device is also a benefit due to its ability to drastically reduce the heat factor in electrical motor operation. Since heat is one of the most destructive things to electric motors, the use of the SAMM device will usually double the life of an electric motor and the reduced generation of heat will help lower air conditioning costs.

The SAMM device can be used on both single- and three-phase motors. This means that it can be applied to small motors in appliances, air conditioners, and other applications all the way up to heavy commercial and industrial venues. The SAMM single-phase device is being designed for home use as a simple plug-in device for home air conditioners, fan systems, refrigerators and other small appliances. Significant savings can be achieved by using the SAMM device in the following types of applications:

- Air conditioning in homes, offices, hospitals, shopping malls, schools, factories, refineries, and various public facilities
- Pumps of various kinds (including those used in California's water system)

- Elevators and escalators

In a collective sense, depending upon the application, the SAMM device has the potential to save between 20 and 40 percent of electrical consumption. Considering California's total consumption figures, this could provide significant savings across the board.

It would be instructive to consider the potential impact of the SAMM device in just one area that is very important in California: air conditioning. Just imagine, during the summer months, how many millions of air conditioning units are cycling on and off all day long. Imagine the peak energy draws as each of these air conditioner motors starts up over and over again. With the SAMM device, a large chunk of that demand spike could be eliminated. Appropriately, Page E-4 of the Draft Report states, in part:

“The Energy Commission recommends an increased emphasis on energy efficiency programs that provide peak savings.”

I would suggest that implementation of the SAMM technology will allow the Commission to significantly achieve not only increased emphasis but, perhaps more important, increased results.

In the area of energy efficiency, the Commission, in its joint efforts with the California Public Utilities Commission (PUC), has an opportunity to put into place programs that can maximize efficiency and savings for consumers.

Not too long ago, we had an example of attempted consumer savings through an effort to offer incentives to replace old refrigerators that used too much electricity. The idea was to replace as many old refrigerators as possible with new more energy-efficient models. While this was a good idea on its face, the fact is that, in a collective sense, there have not been that many refrigerators replaced to date. The reality is that, even with incentives, there are still a vast number of the older units in operation and they are continuing to impose an added drain on our electrical supply and a burden on citizens' utility bills. In addition, many of these older units are owned by individuals whose income levels prevent them from making these types of adjustments. It is also likely that many in this group of people are individuals and families who rely on help from subsidized government programs such as the Low Income Home Energy Assistance Program (LIHEAP). This situation presents an opportunity to take a different approach.

If you take a new energy-efficient refrigerator, and plug it into the single-phase SAMM device, you will still achieve an energy savings of roughly 10 to 20 percent. More importantly, if you plug in one of the older less efficient refrigerators, you will be able to

achieve an energy savings of between 20 and 40 percent. Considering the realities of the current refrigerator population, perhaps it would make sense to provide LIHEAP recipients with SAMM devices for their homes. This would reduce the consumers' overall electric bills and would maximize each LIHEAP dollar.

Page 57 of the Draft Report states, in part:

“The Energy Commission should continue evaluating energy-using technologies for possible incorporation in periodic updates to building and appliance standards.”

Considering the potential of the SAMM devices, upon verification of its efficacy, it would seem to make sense to incorporate the utilization of SAMM technology into the structuring of California's standards for appliances and buildings.

Energy Generation

The other item to be discussed today relates to the provision of new sources of electrical generation. The process in question involves the biomass sector where power is generated by a process called “pyrogenic gasification”.

The Draft Report correctly acknowledges the current lack of incentive and progress in promoting new sources of generation. Page 55 of the Draft Report states, in part:

“...distributed generation sources, including combined heat and power facilities and renewable technologies, have not received the regulatory attention and encouragement necessary to meet the desires of policy makers to see increasing reliance on these resources.”

This cited deficiency can be addressed by taking advantage of the latest technology that I am suggesting today.

Pyrogenic gasification plants can be constructed now that will solve two major problems currently facing cities and states all across the nation. Two of the major problems we are facing are: (1) a need for more cost-effective and environmentally-sensitive electrical energy; and (2) a means of disposing of municipal and other solid waste materials in an appropriate and efficient manner.

Los Angeles County is a prime example of our current needs on the two fronts just mentioned. The County, along with the entire State, has a pressing need for more energy.

Southern California Edison recently advertised for more generation facilities to supply electricity for the grid in Southern California. In addition, Los Angeles is approaching a crisis point in terms of its municipal solid waste. The remaining two local landfills are reaching capacity and there is a somewhat frantic search for solutions – some of which will be exceedingly expensive.

We have the capability to construct pyrogenic gasification plants that will not only produce significant amounts of electricity but will also simultaneously consume vast amounts of solid waste materials. The process works as follows:

- Various forms of waste are gathered for processing. The various forms of waste are referred to as “feedstock”.
- The waste to be used in the process includes municipal solid waste; industrial waste such as greases, oils, solvents, wood chips, sawdust, food processing, and sludge; agricultural products such as crop waste, rice stalks and hulls, hay and straw, and manure; rubber products such as tires; and pulp mill and timber waste.
- The various waste materials are heated (not burned) in an oxygen-free environment thus producing a gaseous product similar to natural gas. The process results in carbon and hydrogen atoms being cracked out of the feedstock in the same relative manner as heat is used to crack crude oils. Materials that remain after gasification exit the process as a solid, non-toxic char residue.
- The generated gas is used to fuel specially designed turbines that generate electricity in a combined-cycle plant.
- Materials from current landfills can be used as feedstock and the resulting char material becomes inert, non-toxic, and unpolluted fill at only 10 percent of its original volume.

There are several beneficial ramifications in using the pyrogenic gasification process. For example, the U.S. Environmental Protection Agency (EPA) has projected that after the year 2000, the United States will generate 216 million tons of municipal solid waste per year. Using the suggested gasification process, approximately 8,000 BTU's can be generated from a single pound of municipal solid waste. Considering the annual volume of 216 million tons, we could be looking at 3,460,000,000,000 BTU's nationwide. One barrel of oil represents approximately 4,200,000 BTU's. When you crunch the numbers, this means that the United States is burying, as a problem, the equivalent of 824,000,000 barrels of oil each year. With the current and projected costs of a barrel of oil, we should be looking for alternatives.

From an environmental standpoint, the only emission coming from the pyrogenic gasification process is water vapor. This is in stark contrast to the use of fossil fuels.

The Draft Report, on Page E-3, states, in part:

“An important alternative to building new central station generating plants is distributed generation, which is electricity produced on site or close to load centers that are also connected to the utility distribution system. The most efficient and cost-effective form of distributed generation is cogeneration or combined heat and power.”

The proposed pyrogenic gasification plants provide the flexibility to allow for extensive opportunities for distributed generation. The unique construction of pyrogenic gasification plants will provide opportunities to site plants in many different locations that can be connected to existing grid systems.

On Page 103 of the Draft Report, comments are made about the activities of the California Biomass Collaborative and the Interagency Working Group on Bioenergy. It also mentions the need to collaborate with federal agencies to leverage state and federal funding for biomass research, development, and demonstration projects. In terms of the pyrogenic gasification process, much of the research and development has already been accomplished. My partners and I would welcome the opportunity to work on a potential demonstration project that would verify the efficacy of this new approach.

Future Activities

With regard to the proposal concepts presented herewith, my partners and I will be glad to work with the Commission, its technical staff, and all other appropriate California stake holders, in order to bring the promises of our new technology to fruition for the citizens of California. We believe that the combined impact of the SAMM technology and the use of pyrogenic gasification generation will play a significant role in meeting California's energy needs.

